**HOUSE DUST - house dust injection, solution**
**ALMOND - almond injection, solution**
**APPLE - apple injection, solution**
**APRICOT - apricot injection, solution**
**ASPARAGUS - asparagus injection, solution**
**AVOCADO - avocado injection, solution**
**BANANA - banana injection, solution**
**BARLEY - barley injection, solution**
**BEAN - bean injection, solution**
**STRING BEAN - string bean injection, solution**
**BEEF - beef injection, solution**
**BRAZIL NUT - brazil nut injection, solution**
**BROCCOLI - broccoli injection, solution**
**BUCKWHEAT - buckwheat injection, solution**
**CABBAGE - cabbage injection, solution**
**CANTALOUPE - cantaloupe injection, solution**
**CARROT - carrot injection, solution**
**CASEIN - casein injection, solution**
**CELERY - celery injection, solution**
**CHERRY - cherry injection, solution**
**CHICKEN - chicken injection, solution**
**CINNAMON - cinnamon injection, solution**
**CLAM - clam injection, solution**
**COCOA BEAN - cocoa bean injection, solution**
**COCONUT - coconut injection, solution**
**CODFISH - codfish injection, solution**
**COFFEE BEAN - coffee bean injection, solution**
**CRAB - crab injection, solution**
**CUCUMBER - cucumber injection, solution**
**EGG WHITE - egg white injection, solution**
**EGG - egg injection, solution**
**EGG YOLK - egg yolk injection, solution**
**FLOUNDER - flounder injection, solution**
**GARLIC - garlic injection, solution**
**GRAPE - grape injection, solution**
**GRAPEFRUIT - grapefruit injection, solution**
**KARAYA GUM - karaya gum injection, solution**
**HONEYDEW MELON - honeydew melon injection, solution**
**LAMB - lamb injection, solution**
**LEMON - lemon injection, solution**
**LETTUCE - lettuce injection, solution**
**LIMA BEAN - lima bean injection, solution**
**LOBSTER - lobster injection, solution**
**GOAT MILK - goat milk injection, solution**
**COW MILK - cow milk injection, solution**
**MUSHROOM - cultivated mushroom injection, solution**
**MUSTARD SEED - mustard seed injection, solution**
**OAT - oat injection, solution**
**BLACK OLIVE - black olive injection, solution**
**ONION - onion injection, solution**
**ORANGE - orange injection, solution**
**OYSTER - oyster injection, solution**
**PEA - pea injection, solution**
**PEACH - peach injection, solution**
**PEANUT - peanut injection, solution**
**PEAR - pear injection, solution**
**PECAN - pecan injection, solution**
**GREEN BELL PEPPER - green bell pepper injection, solution**
**BLACK PEPPER - black pepper injection, solution**
**PINEAPPLE - pineapple injection, solution**

**PISTACHIO - pistachio injection, solution**
**PLUM - plum injection, solution**
**PORK - pork injection, solution**
**POTATO - potato injection, solution**
**POTATO - potato injection, solution**
**RICE - rice injection, solution**
**RYE - rye injection, solution**
**SALMON - salmon injection, solution**
**SESAME SEED - sesame seed injection, solution**
**SHRIMP - shrimp injection, solution**
**SOYBEAN - soybean injection, solution**
**SPINACH - spinach injection, solution**
**SQUASH - squash injection, solution**
**STRAWBERRY - strawberry injection, solution**
**CORN - corn injection, solution**
**TOMATO - tomato injection, solution**
**TUNA - tuna injection, solution**
**TURKEY - turkey injection, solution**
**VANILLA - vanilla injection, solution**
**ENGLISH WALNUT - english walnut injection, solution**
**WATERMELON - watermelon injection, solution**
**WHEAT - wheat injection, solution**
**BOS TAURUS SKIN - bos taurus skin injection, solution**
**COTTON FIBER - cotton fiber injection, solution**
**COTTON SEED - cotton seed injection, solution**
**CANIS LUPUS FAMILIARIS SKIN - canis lupus familiaris skin injection, solution**
**CAVIA PORCELLUS SKIN - cavia porcellus skin injection, solution**
**EQUUS CABALLUS SKIN - equus caballus skin injection, solution**
**CEIBA PENTANDRA FIBER - ceiba pentandra fiber injection, solution**
**MUS MUSCULUS SKIN - mus musculus skin injection, solution**
**ORRIS - orris injection, solution**
**PYRETHRUM CINERARIIFOLIUM - pyrethrum cinerariifolium injection, solution**
**RABBIT - rabbit injection, solution**
**SOLENOPSIS INVICTA - solenopsis invicta injection, solution**
**PERIPLANETA AMERICANA - periplaneta americana injection, solution**
**BLATELLA GERMANICA - blatella germanica injection, solution**
**ACREMONIUM STRICTUM - acremonium strictum injection, solution**
**ALTERNARIA TENUIS - alternaria alternata injection, solution**
**ASPERGILLUS FUMIGATUS - aspergillus fumigatus injection, solution**
**ASPERGILLUS NIGER VAR NIGER - aspergillus niger var. niger injection, solution**
**AUREOBASIDIUM PULLULANS VAR PULLULANS - aureobasidium pullulans var. pullutans injection, solution**
**BOTRYTIS CINEREA - botrytis cinerea injection, solution**
**CANDIDA ALBICANS - candida albicans injection, solution**
**CHAETOMIUM GLOBOSUM - chaetomium globosum injection, solution**
**CLADOSPORIUM CLADOSPORIOIDES - cladosporium cladosporioides injection, solution**
**CLADOSPORIUM SPHAEROSPERMUM - cladosporium sphaerospermum injection, solution**
**COCHLIOBOLUS SATIVUS - cochliobolus sativus injection, solution**
**EPICOCCUM NIGRUM - epicoccum nigrum injection, solution**
**FUSARIUM OXYSPORUM VASINFECTUM - fusarium oxysporum vasinfectum injection, solution**
**HELMINTHOSPORIUM SOLANI - helminthosporium solani injection, solution**
**MUCOR PLUMBEUS - mucor plumbeus injection, solution**
**NEUROSPORA INTERMEDIA - neurospora intermedia injection, solution**
**KHUSKIA ORYZAE - khuskia oryzae injection, solution**
**PHOMA EXIGUA VAR EXIGUA - phoma exigua var. exigua injection, solution**
**RHIZOPUS ARRHIZUS VAR ARRHIZUS - rhizopus arrhizus var. arrhizus injection, solution**
**RHODOTORULA RUBRA - rhodotorula rubra injection, solution**
**USTILAGO MAYDIS - ustilago maydis injection, solution**
**USTILAGO TRITICI - ustilago tritici injection, solution**
**STEMPHYLIUM SOLANI - stemphylium solani injection, solution**
**TRICHOPHYTON MENTAGROPHYTES - trichophyton mentagrophytes injection, solution**

**PENICILLIUM CHRYSOGENUM VAR CHRYSOGENUM - penicillium chrysogenum var. chrysogenum injection, solution**
**ACACIA - acacia injection, solution**
**ALNUS INCANA SSP RUGOSA POLLEN - alnus incana subsp. rugosa pollen injection, solution**
**MEDICAGO SATIVA POLLEN - medicago sativa pollen injection, solution**
**FRAXINUS AMERICANA POLLEN - fraxinus americana pollen injection, solution**
**PASPALUM NOTATUM POLLEN - paspalum notatum pollen injection, solution**
**MORELLA CERIFERA POLLEN - morella cerifera pollen injection, solution**
**FAGUS GRANDIFOLIA POLLEN - fagus grandifolia pollen injection, solution**
**BETULA LENTA POLLEN - betula lenta pollen injection, solution**
**BETULA NIGRA POLLEN - betula nigra pollen injection, solution**
**BETULA LENTA POLLEN - betula lenta pollen injection, solution**
**ACER NEGUNDO POLLEN - acer negundo pollen injection, solution**
**AMARANTHUS PALMERI POLLEN - amaranthus palmeri pollen injection, solution**
**JUNIPERUS ASHEI POLLEN - juniperus ashei pollen injection, solution**
**JUNIPERUS VIRGINIANA POLLEN - juniperus virginiana pollen injection, solution**
**XANTHIUM STRUMARIUM VAR CANADENSE POLLEN - xanthium strumarium var. canadense pollen injection, solution**
**POPULUS DELTOIDES POLLEN - populus deltoides pollen injection, solution**
**CUPRESSUS ARIZONICA POLLEN - cupressus arizonica pollen injection, solution**
**TAXODIUM DISTICHUM POLLEN - taxodium distichum pollen injection, solution**
**RUMEX ACETOSELLA POLLEN - rumex acetosella pollen injection, solution**
**RUMEX CRISPUS POLLEN - rumex crispus pollen injection, solution**
**ULMUS AMERICANA POLLEN - ulmus americana pollen injection, solution**
**SOLIDAGO CANADENSIS POLLEN - solidago canadensis pollen injection, solution**
**CELTIS OCCIDENTALIS POLLEN - celtis occidentalis pollen injection, solution**
**CARYA OVATA POLLEN - carya ovata pollen injection, solution**
**SORGHUM HALEPENSE POLLEN - sorghum halepense pollen injection, solution**
**JUNIPERUS CALIFORNICA POLLEN - juniperus californica pollen injection, solution**
**KOCHIA SCOPARIA POLLEN - kochia scoparia pollen injection, solution**
**CHENOPODIUM ALBUM POLLEN - chenopodium album pollen injection, solution**
**ACER RUBRUM POLLEN - acer rubrum pollen injection, solution**
**ACER SACCHARUM POLLEN - acer saccharum pollen injection, solution**
**IVA XANTHIFOLIA POLLEN - iva xanthifolia pollen injection, solution**
**IVA ANNUA VAR ANNUA POLLEN - iva annua var. annua pollen injection, solution**
**PROSOPIS JULIFLORA POLLEN - prosopis juliflora pollen injection, solution**
**ARTEMISIA VULGARIS POLLEN - artemisia vulgaris pollen injection, solution**
**MORUS RUBRA POLLEN - morus rubra pollen injection, solution**
**MORUS ALBA POLLEN - morus alba pollen injection, solution**
**QUERCUS RUBRA POLLEN - quercus rubra pollen injection, solution**
**QUERCUS VIRGINIANA POLLEN - quercus virginiana pollen injection, solution**
**QUERCUS ALBA POLLEN - quercus alba pollen injection, solution**
**OLEA EUROPAEA POLLEN - olea europaea pollen injection, solution**
**SYAGRUS ROMANZOFFIANA POLLEN - syagrus romanzoffiana pollen injection, solution**
**CARYA ILLINOINENSIS POLLEN - carya illinoinensis pollen injection, solution**
**AMARANTHUS RETROFLEXUS POLLEN - amaranthus retroflexus pollen injection, solution**
**PINUS STROBUS POLLEN - pinus strobus pollen injection, solution**
**PLANTAGO LANCEOLATA POLLEN - plantago lanceolata pollen injection, solution**
**POPULUS ALBA POLLEN - populus alba pollen injection, solution**
**LIGUSTRUM VULGARE POLLEN - ligustrum vulgare pollen injection, solution**
**ELYMUS REPENS POLLEN - elymus repens pollen injection, solution**
**AMBROSIA TRIFIDA POLLEN - ambrosia trifida pollen injection, solution**
**SALSOLA KALI POLLEN - salsola kali pollen injection, solution**
**ARTEMISIA TRIDENTATA POLLEN - artemisia tridentata pollen injection, solution**
**LIQUIDAMBAR STYRACIFLUA POLLEN - liquidambar styraciflua pollen injection, solution**
**PLATANUS OCCIDENTALIS POLLEN - platanus occidentalis pollen injection, solution**
**JUGLANS NIGRA POLLEN - juglans nigra pollen injection, solution**
**AILANTHUS ALTISSIMA POLLEN - ailanthus altissima pollen injection, solution**
**POPULUS TREMULOIDES POLLEN - populus tremuloides pollen injection, solution**
**POA ANNUA POLLEN - poa annua pollen injection, solution**

**BROMUS INERMIS POLLEN - bromus inermis pollen injection, solution**
**ZEA MAYS POLLEN - zea mays pollen injection, solution**
**POPULUS FREMONTII POLLEN - populus fremontii pollen injection, solution**
**POPULUS DELTOIDES SSP MONILIFERA POLLEN - populus deltoides subsp. monilifera pollen injection, solution**
**EUPATORIUM CAPILLIFOLIUM POLLEN - eupatorium capillifolium pollen injection, solution**
**ULMUS CRASSIFOLIA POLLEN - ulmus crassifolia pollen injection, solution**
**ULMUS PUMILA POLLEN - ulmus pumila pollen injection, solution**
**EUCALYPTUS GLOBULUS POLLEN - eucalyptus globulus pollen injection, solution**
**CORYLUS AMERICANA POLLEN - corylus americana pollen injection, solution**
**ROBINIA PSEUDOACACIA POLLEN - robinia pseudoacacia pollen injection, solution**
**MELALEUCA QUINQUENERVIA POLLEN - melaleuca quinquenervia pollen injection, solution**
**CHENOPODIUM AMBROSIOIDES POLLEN - chenopodium ambrosioides pollen injection, solution**
**QUERCUS AGRIFOLIA POLLEN - quercus agrifolia pollen injection, solution**
**QUERCUS ALBA POLLEN - quercus alba pollen injection, solution**
**SCHINUS MOLLE POLLEN - schinus molle pollen injection, solution**
**AMARANTHUS SPINOSUS POLLEN - amaranthus spinosus pollen injection, solution**
**CASUARINA EQUISETIFOLIA POLLEN - casuarina equisetifolia pollen injection, solution**
**PINUS ECHINATA POLLEN - pinus echinata pollen injection, solution**
**AMBROSIA ACANTHICARPA POLLEN - ambrosia acanthicarpa pollen injection, solution**
**AMBROSIA TENUIFOLIA POLLEN - ambrosia tenuifolia pollen injection, solution**
**AMBROSIA BIDENTATA POLLEN - ambrosia bidentata pollen injection, solution**
**AMBROSIA PSILOSTACHYA POLLEN - ambrosia psilostachya pollen injection, solution**
**LOLIUM PERENNE SSP MULTIFLORUM POLLEN - lolium perenne ssp. multiflorum pollen injection, solution**
**ARTEMISIA FRIGIDA POLLEN - artemisia frigida pollen injection, solution**
**DISTICHLIS SPICATA POLLEN - distichlis spicata pollen injection, solution**
**HOLCUS LANATUS POLLEN - holcus lanatus pollen injection, solution**
**JUGLANS NIGRA POLLEN - juglans nigra pollen injection, solution**
**JUGLANS REGIA POLLEN - juglans regia pollen injection, solution**
**TRITICUM AESTIVUM POLLEN - triticum aestivum pollen injection, solution**
**ARTEMISIA ANNUA POLLEN - artemisia annua pollen injection, solution**
**AMARANTHUS TUBERCULATUS POLLEN - amaranthus tuberculatus pollen injection, solution**
**COTTON FIBER - cotton fiber injection, solution**
**ACREMONIUM STRICTUM - acremonium strictum injection, solution**
**AUREOBASIDIUM PULLULANS VAR PULLULANS - aureobasidium pullulans var. pullutans injection, solution**
**COCHLIOBOLUS SATIVUS - cochliobolus sativus injection, solution**
**MUCOR PLUMBEUS - mucor plumbeus injection, solution**
**SACCHAROMYCES CEREVISIAE - saccharomyces cerevisiae injection, solution**
**FRAXINUS VELUTINA POLLEN - fraxinus velutina pollen injection, solution**
**AMARANTHUS RETROFLEXUS POLLEN - amaranthus retroflexus pollen injection, solution**
**LIQUIDAMBAR STYRACIFLUA POLLEN - liquidambar styraciflua pollen injection, solution**
**JUGLANS NIGRA POLLEN - juglans nigra pollen injection, solution**
**SALIX NIGRA POLLEN - salix nigra pollen injection, solution**
ALK-Abello, Inc.

**ALLERGENIC EXTRACTS, FOR DIAGNOSTIC USE ONLY**
**DIRECTIONS FOR USE**

**WARNINGS**

**This product is intended for use by physicians who are experienced in the administration of allergenic extracts and the emergency care of anaphylaxis, or for use under the guidance of an allergy specialist.**
**As with all allergenic extracts, severe systemic reactions may occur. In certain individuals these life-threatening reactions may result in death. Fatalities associated with skin testing have been reported. Patients should be observed for at least 20 - 30 minutes following testing. Emergency measures and adequately trained personnel should be immediately available in the event of a life-threatening reaction.**
**Patients with unstable asthma or steroid dependent asthmatics and patients with underlying cardiovascular disease are at greater risk to a fatal outcome from a systemic allergic reaction.**
**Sensitive patients may experience severe anaphylactic reactions resulting in respiratory obstruction, shock, coma and/or death. Adverse events are to be reported to MedWatch (1-800-FDA-1088), Adverse Experience Reporting, HFM-210 Center for Biologics Evaluation & Research, Food and Drug Administration, 1401 Rockville Pike, Rockville, MD 20852-1448.**
**This product should not be injected intravenously. Patients receiving beta blockers may not be responsive to epinephrine or inhaled bronchodilators. Respiratory obstruction not responding to parenteral or inhaled bronchodilators may require theophylline, oxygen, intubation and the use of life support systems. Parenteral fluid and/or plasma expanders may be utilized for the treatment of shock. Adrenocorticosteroids may be administered parenterally or intravenously.**
**Refer to WARNINGS, PRECAUTIONS, and ADVERSE REACTIONS sections below.**

## DESCRIPTION

Sterile diagnostic extracts are supplied in either phenol-saline diluent for Intradermal Testing or in diluent containing glycerin 50% (v/v) for Percutaneous Testing and phenol 0.4% (preservative). Inactive ingredients may include: sodium chloride for isotonicity, glycerin, and sodium bicarbonate as a buffer. Inactive ingredients in mold extracts may include residual potassium phosphate, and calcium carbonate from growth media.
Pollens are individually extracted from pure pollen extracted in a phenol-preserved sodium bicarbonate solution. Short Ragweed and Mixed (Tall and Short) Ragweed extracts are standardized by Antigen E content and so labeled. The Antigen E content of extracts containing Short Ragweed at a concentration more dilute than a weight/volume ratio of 1:10 are obtained by calculating the Antigen E content based on the assay value of more concentrated extract. Pollen extracts are filtered aseptically and after final packaging, they are tested for sterility and safety.
House Dust, a heterogenous, widely distributed allergen, is among the most frequently encountered as a primary or accompanying cause of allergic symptoms. Allergic inhalants found in house dust include mites, insects, mold spores, feathers, animal dander, pollens, hairs, food and cleansing agent residues. Individual environs may contain certain items not ordinarily found so that a stock house dust extract may not elicit a response on testing. House Dust Extracts are prepared from dust collected from homes and from establishments which clean household rugs. It is extracted from buffered, aqueous extracting fluid. House Dust Extract is dialyzed, filtered aseptically, and after final packaging is tested for sterility and safety.
Molds (fungi) are present in all inhabited places at all seasons of the year; they are so ubiquitous that they are prevalent at times when common allergic pollens and other inhalants are not. In the home and surroundings, molds are found in upholstered furniture, mattresses, drapes, cellar and storage room dust, woolens, leather goods, fruits, meats, cheeses, garden soil and on plants. Spores, mycelial fragments and mold residues are thus inhaled, contacted and ingested continuously. Mold extracts are extracted in a phenol preserved saline solution. The extract is dialyzed, filtered aseptically and after final packaging is tested for sterility and safety.
Foods, miscellaneous inhalants and epidermals are individually extracted in phenol preserved saline, filtered aseptically and after final packaging are tested for sterility and safety.

## CLINICAL PHARMACOLOGY

Diagnostically (for skin testing), the allergen combines with IgE antibodies fixed to mast cells in the skin. This complexing causes an increase in cellular permeability and degranulation of the mast cells releasing chemical mediators. These mediators (such as histamine) are responsible for a local inflammatory response of wheal and erythema typical of a positive skin test reaction and also, the symptoms commonly associated with allergic disease.[1] The more mediator release, the larger the reaction (wheal and erythema).

## INDICATIONS AND USAGE

These products are for diagnostic use only. Diagnostic allergenic extracts are indicated for use in skin testing to establish the clinical relevance of specific allergens to which the patient has been exposed. By measuring skin test response the physician may assess the degree of sensitivity that patients have to the allergens. For extracts standardized in AU and BAU, see individual directions for use. **Allergenic extracts for diagnostic use only of coffee, mosquito, cottonseed, and flaxseed have not been shown by adequate data to be safe and effective for therapeutic use.**

**CONTRAINDICATIONS**

Patients on beta blockers can be non-responsive to beta agonists that may be required to reverse a systemic reaction (also, see boxed **WARNINGS** statement and **ADVERSE REACTIONS**). The physician should carefully weigh the benefit derived from skin testing vs. the risk to the patient should a systemic reaction arise.

Patients with unstable asthma or steroid dependent asthmatics and patients with underlying cardiovascular disease are at greater risk to a fatal outcome from a systemic allergic reaction[2, 3.] See also **PRECAUTIONS** and **ADVERSE REACTIONS**.

**WARNINGS**

Patients should always be observed for at least 20 - 30 minutes after skin testing. In the event of a marked systemic reaction such as urticaria, angioedema, wheezing, dyspnea, respiratory obstruction, hypotension, coma and death (see **ADVERSE REACTIONS)**, applications of a tourniquet above the injection site and administration of 0.2 mL to 1 mL (0.01 mg/kg) of epinephrine injection (1:1,000) are recommended. Maximal recommended dose for children between 2 and 12 years of age is 0.5 mL. The tourniquet is then gradually released at 15 minute intervals. Patients under treatment with beta blockers may be refractory to the usual dose of epinephrine.

Volume expanders and vasopressor agents may be required to reverse hypotension, inhalation bronchodilators and parenteral aminophylline may be required to reverse bronchospasm. In case of respiratory obstruction, oxygen and intubation may be necessary. Life-threatening reactions unresponsive to the above may require cardiopulmonary resuscitation.

**PRECAUTIONS**

**INFORMATION FOR PATIENTS:**

Patients should be instructed to describe any active allergic symptoms such as rhinitis, wheezing, dyspnea, etc. prior to testing. Also, see **ADVERSE REACTIONS** and **WARNINGS** Sections.

Patients should always be observed 20 to 30 minutes after testing.

**General:**

1. In the presence of active symptoms such as rhinitis, wheezing, dyspnea, etc., the indications for skin testing must be weighed carefully against the risk of temporarily aggravating the symptoms by the testing itself. Objective assessment of pulmonary function such as Peak Expiratory Flow Rate (PEFR) before allergen administration and prior to discharge may be useful in unstable asthmatics to reduce the chances of exacerbation of the patient's asthma. Patients should be instructed to describe any active allergic symptoms as described above prior to skin testing and encouraged to report any late reactions from this testing. Also, see **ADVERSE REACTIONS** and **WARNINGS** sections.

2. Store allergenic extracts between $2^{o}$ - $8^{o}$ C at all times, even during use.

3. Care must be taken to avoid drawing blood.
1. For percutaneous testing, if blood is observed, immediately wipe the allergen from the site.
2. For intradermal skin testing, pull gently on the syringe plunger and note if any blood enters the syringe. If blood is obtained, reposition the needle and repeat before injecting (see **DOSAGE AND ADMINISTRATION**).

4. Allergenic extracts become less potent with age. Allergenic extracts containing glycerin 50% v/v are relatively stable. Non-glycerinated aqueous extracts, particularly dilute forms as used for intradermal skin testing, have been shown to be extremely unstable. Until such time as stability studies are complete with dilute allergens, new intradermal strength materials should be prepared every few weeks.

5. Use standard aseptic precautions if making dilutions from stock concentrates to intradermal strength.

6. For intradermal testing: Extracts in glycerin 50% v/v must be diluted with a non-glycerinated diluent and must be diluted at least 25-fold to less than 2% glycerin by volume, as glycerin above this level can cause false positive intradermal skin test results.

**PREGNANCY - CATEGORY C:**

Animal reproduction studies have not been conducted with allergenic extracts. It is also not known whether allergenic extracts can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity.

Controlled studies of hyposensitization with moderate to high doses of allergenic extracts during conception and all trimesters of pregnancy have failed to demonstrate any risk to the fetus or to the mother[4]. However, on the basis of histamine's known ability to contract the uterine muscle, the release of significant amounts of histamine from allergen exposure to skin test overdose should be avoided on theoretical grounds. Therefore, allergenic extracts should be used cautiously in a pregnant woman and only if clearly needed.

**Pediatric Use:**
Allergenic extracts for diagnostic use have been given safely in infants and young children. Infants have lower skin test reactivity to histamine, as well as common allergens. Skin test reactivity gradually increases to age 6 and plateaus to age 60. Therefore, small skin test reactions should be anticipated in children under age 6.

**Geriatric Use:**
Skin test reactivity gradually decreases after age 60. Therefore, smaller skin test reactions should be anticipated in adults over age 60.

**Nursing Mothers:**
It is not known if allergens administered subcutaneously appear in human milk. Because many drugs are excreted in human milk, caution should be exercised when allergenic extracts are administered to a nursing woman.

**Carcinogenesis, mutagenesis, impairment of fertility:**
Studies in animals have not been performed.

**Drug Interactions:**
Drugs can interfere with the performance of skin tests[5].

Antihistamines: Response to mediator (histamine) released by allergens is suppressed by antihistamines. The length of suppression varies and is dependent on individual patient, type of antihistamine and length of time the patient has been on antihistamines. The duration of this suppression may be as little as 24 hours (chlorpheniramine), and can be as long as 40 days (astemizole).

Tricyclic Antidepressants: These exert a potent and sustained decrease of skin reactivity to histamine which may last for a few weeks.

$Beta_2$ Agonists: Oral terbutaline and parenteral ephedrine, in general, have been shown to decrease allergen induced wheal.

Dopamine: Intravenous infusion of dopamine may inhibit skin test responses.

Beta Blocking Agents: Propanolol can significantly increase skin test reactivity.

Other Drugs: Short acting steroids, inhaled $beta_2$ agonists, theophylline and cromolyn do not seem to affect skin test response.

## ADVERSE REACTIONS

Fatalities from skin testing in the United States have been extensively reviewed by Lockey.[2] Six fatalities were associated with intradermal testing without previous percutaneous testing and one was associated with a combination of percutaneous (scratch) and intradermal skin testing. With careful attention to dosage and administration, fatal reactions occur infrequently, but it must be remembered that allergenic extracts are highly potent to sensitive individuals and overdosage could result in anaphylactic symptoms. Therefore it is imperative that physicians administering allergenic extracts for skin testing understand, and be prepared for the treatment of severe reactions.
**Local:** Immediate wheal and erythema reactions are to be expected; but if very large, may be the first manifestation of a systemic reaction. In such cases, immediately wipe the test site(s) with sterile gauze or cotton to remove excess allergen.
**Systemic Reactions:** Systemic reactions are characterized by one or more of the following symptoms: sneezing, mild to severe generalized urticaria, itching (other than at the skin test site), extensive or generalized edema, wheezing, asthma, dyspnea, cyanosis, hypotension, syncope, and upper airway obstruction. Symptoms may progress to shock and death. Patients should always be observed for at least 20 - 30 minutes after testing.
Volume expanders and vasopressor agents may be required to reverse hypotension. Inhalational bronchodilators and parenteral aminophylline may be required to reverse bronchospasm. Severe airway obstruction unresponsive to bronchodilator may require tracheal intubation and use of oxygen. In the event of a marked systemic reaction, application of a tourniquet above the injection site and the administration of 0.02 mL to 1.0 mL of epinephrine injection (1:1,000) is recommended. Maximum recommended dose for children between 2 and 12 years of age is 0.3 mL. The tourniquet should not be left in place without loosening for 90 seconds every 15 minutes.
Adverse events should be reported via MedWatch (1-800-FDA-1088). Adverse experience Reporting, HFM-210 Center for Biologics Evaluation & Research, Food and Drug Administration, 1401 Rockville Pike, Rockville, MD 20852-1448.

## OVERDOSAGE
Signs and symptoms of overdose are typically large local and systemic reactions. For management of overdose reactions, refer to the **ADVERSE REACTIONS** section above.

**DOSAGE AND ADMINISTRATION**

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit.

Skin test techniques for immediate (Type I) hypersensitivity testing fall into two major categories: percutaneous, and intracutaneous.

**Percutaneous techniques:** For percutaneous testing, in general, skin is scratched, punctured or pricked just before the allergen is applied or through a drop of test allergen. There are several devices available for this technique. Refer to the manufacturer or distributor's circular for specific directions for their use.

In General:

1. It is recommended that the test areas should be placed no closer than 4 - 5 cm apart to avoid interference of reactions when several tests are applied.

2. Skin test areas should be cleansed with alcohol and air dried.

3. Preferably, the allergen should be placed on the volar surface of the forearm, upper arm, or the patient's back. The patient should be placed in a comfortable position prior to testing.

4. For scratch testing, a sharp, clean, sterile instrument is used to abrade the skin, but not to draw blood. Each scratch should be about 2 - 4 mm in length. A small drop of extract is placed on the surface of the skin.

5. Prick testing: For prick testing, a sharp, sterile instrument is used to puncture the skin slightly, applying it at a 15 - 20$^{o}$ angle to the skin. The instrument is gently raised, "tenting" the skin until it pops out, generally pricking through the drop of allergen. Do not draw blood.

6. For puncture testing, a sharp, clean, sterile instrument must be used. Puncture the skin, through the drop of allergen, perpendicular to the skin. Do not draw blood.

For all of the above techniques, a separate instrument must be used for each patient; if the instrument is to be used to pass through the allergen, to avoid cross-contamination, a separate instrument is to be used for each allergen. The test should be read in 15 minutes, measuring both wheal size and erythema.

**Intracutaneous (intradermal) testing:** General: Intradermal testing is more sensitive than percutaneous testing and its specificity is dependent on dose. Intradermal testing is not intended as an initial screen unless used in highly dilute solutions. Intradermal testing is usually reserved for allergens that have demonstrated either negative or equivocal percutaneous skin test response in the face of positive or unclear history.

Intradermal testing of one allergen in several serial dilutions (beginning with the weakest to the more concentrated dilutions) may also be useful in assessing degree of patient sensitivity for the establishment of a safe starting dose for immunotherapy.

Bulk extracts must be diluted for intradermal testing. Use of Sterile Diluent for Allergenic Extracts or Sterile Diluent for Allergenic Extracts Normal Saline with HSA (albumin saline) is recommended. Dilutions should be made with sterile disposable syringes using aseptic technique. Commonly, 10 fold dilutions are used to achieve a desired concentration for intradermal testing and continuation of immunotherapy. For example, transferring 0.5 mL of a 10,000 PNU/mL extract into 4.5 mL of diluent will yield 5 mL of extract at 1,000 PNU/mL. For weight volume products, a 1:100 w/v dilution may be prepared from a 1:10 w/v by transferring 0.5 mL of the 1:10 w/v to 4.5 mL of diluent. Prepare as many additional serial dilutions as necessary to reach the appropriate concentration.

As a general rule intradermal strength should begin at no higher than 1/100 to 1/1000 of the percutaneous strength that resulted in a negative skin test reaction.

1. It is recommended that the test areas should be spaced no less than 5 cm apart to avoid interference with adjacent allergen or control.

2. Skin should be cleansed with alcohol and air dried.

3. A sterile 1 mL or ½ mL syringe with a 26 - 30 gauge needle should be used. A separate sterile syringe should be used for each extract and each patient.

4. Care should be taken to eliminate air bubbles from the syringe prior to injecting the test dose. It is suggested that not more than 6 - 10 allergens of each different type be used at any one time. Very sensitive patients may show rapid response.

5. The skin is held tensely, and the needle is inserted almost parallel to the skin, beveled side up far enough to cover the beveled portion. Slowly inject sufficient extract to make a small bleb of approximately 5 mm in diameter (0.01 - 0.02 mL).

6. Read the test results in 15 minutes.

Selection of the proper strength for intracutaneous testing: A general rule for the prevention of untoward reactions, particularly in extremely sensitive patients, is to screen by percutaneous methods initially, and begin intradermal testing at a strength not more than 1/100 of a negative or equivocal percutaneous reaction.

**Controls:** In both percutaneous and intracutaneous tests, a negative control test with diluent alone should be performed because some patients exhibit dermographia, and/or other non-specific irritant responses.

As a positive control in the evaluation of allergenic skin testing, histamine 1 mg/mL (histamine base) should be used for percutaneous testing, and histamine 0.1 mg/mL (histamine base) should be used for intradermal testing.

**Interpretation of results:** Patient's response is graded on the basis of the size of erythema or wheal.[6] General guidelines follow for percutaneous testing, different devices and/or techniques influence the size of the reaction, therefore it is important to refer to the device manufacturer's or distributor's instructions when grading reactions.

**Percutaneous (prick or scratch) test:**

| | |
|---|---|
| 0 | No reaction or less than control. |
| + | Erythema greater than control, smaller than a nickel (21 mm diameter). |
| ++ | Erythema greater than a nickel in diameter, no wheal. |
| +++ | Wheal and erythema without pseudopods. |
| ++++ | Wheal and erythema with pseudopods. |

**Intradermal test:**

| | |
|---|---|
| 0 | No reaction or less than negative control. |
| + | 3-4 mm wheal with erythema, or erythema alone larger than a nickel (21 mm diamether). |
| ++ | 4-8 mm wheal and erythema, without pseudopods. |
| +++ | Over 8 mm wheal and erythema without pseudopods |
| ++++ | Wheal and erythema with pseudopods. |

## HOW SUPPLIED

**For scratch and prick testing:** 5 mL dropper applicator vials in 50% v/v glycerin. Available individually and in a complete set of the most common allergens. Available in either Protein Nitrogen Units (PNU/mL) or weight to volume (w/v).

**For intracutaneous testing:** 5 mL sterile vials, aqueous based, individually and in a complete set of the most common allergens. Available in either Protein Nitrogen Units (PNU/mL) or weight to volume (w/v).

**Histatrol**$^{R}$ Positive skin test control - histamine. 1 mg/mL and 0.1 mg/mL histamine base.

**See Product Catalog for specific diagnostic concentrations available.**

## STORAGE

To maintain stability of allergenic extracts, proper storage conditions are essential. Bulk concentrates and diluted extracts are to be stored at $2^{o}$ to $8^{o}$ C even during use. Bulk or diluted extracts are not to be frozen. Do not use after the expiration date shown on the vial label.

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